

**Docket 82215ACPK**  
**Customer No. 01333**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of

Xiaoru Wang, et al

COMPOSITE COLORANT  
PARTICLES

Serial No. 10/665,960

Filed 18 August 2003

Group Art Unit: 1714

Examiner: Callie E. Shosho

Mail Stop APPEAL BRIEF-PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA. 22313-1450

Sir:

**APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 and 35 U.S.C. 134**

## **Table Of Contents**

|   |    |
|---|----|
| <b><u>Table Of Contents</u></b> .....                             | i  |
| <b><u>Real Party In Interest</u></b> .....                        | 1  |
| <b><u>Related Appeals And Interferences</u></b> .....             | 1  |
| <b><u>Status Of The Claims</u></b> .....                          | 1  |
| <b><u>Status Of Amendments</u></b> .....                          | 1  |
| <b><u>Summary of Claimed Subject Matter</u></b> .....             | 1  |
| <b><u>Grounds of Rejection to be Reviewed on Appeal</u></b> ..... | 2  |
| <b><u>Arguments</u></b> .....                                     | 3  |
| <b><u>Summary</u></b> .....                                       | 8  |
| <b><u>Conclusion</u></b> .....                                    | 9  |
| <b><u>Appendix I - Claims on Appeal</u></b> .....                 | 10 |
| <b><u>Appendix II - Evidence</u></b> .....                        | 14 |
| <b><u>Appendix III – Related Proceedings</u></b> .....            | 15 |

## **APPELLANT'S BRIEF ON APPEAL**

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1, 3-7, and 9-12 which was contained in the Office Action mailed April 5, 2007.

A timely Notice of Appeal was filed August 6, 2007.

### **Real Party In Interest**

As indicated above in the caption of the Brief, the Eastman Kodak Company is the real party in interest.

### **Related Appeals And Interferences**

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

### **Status Of The Claims**

Claims 1, 3-7, and 9-12 are all the claims that are pending and have been finally rejected. All claims have been duly entered. Applicants appeal from the rejections of all pending claims 1, 3-7, and 9-12.

Appendix I provides a clean, double-spaced copy of the claims on appeal.

### **Status Of Amendments**

No amendments have been filed subsequent to the final rejection. All previous amendments have been entered.

### **Summary of Claimed Subject Matter**

Claims 1 and 10 are the only independent claims. The present invention, as defined by claim 1, is directed to composite pigment polymer particles having a pigment phase and a polymer phase. The polymer phase of the particles are formed in the presence of pigment *in situ* using an emulsion polymerization process. The first portion of an addition polymerization initiator consisting essentially of an initiator dissolved in a solvent is added to an aqueous pigment mixture before then adding a monomer mixture for forming the polymer phase to

the pigment mixture to form a pigment/monomer mixture in a continuous process. The dispersion of composite pigment polymer particles are stable as defined by said particles not flocculating for up to 20 minutes when a dispersion containing the particles is added to acetone at a 1% by weight concentration.

Furthermore, the pigment mixture consists essentially of a pigment, a dispersant or surfactant and water, wherein essentially no monomer is present in the aqueous pigment mixture.

Support for this claimed invention is to be found on page 5, lines 3 to 9, under the Summary of the invention, and also on page 6, lines 9 to 18. There are no drawings in the application.

Claim 10 is very similar to claim 1 except for the addition of the limitation that claim 10 states that “wherein sequential addition of initiator to the pigment mixture essentially prior to adding monomer mixture to the pigment mixture allows radicals formed from the initiator to be absorbed to pigment surface and, when monomer mixture is added later, provides polymerization on the pigment surface rather than the formation of separated polymer particles” instead of, as in claim 1, the phrase “wherein essentially no monomer is present in the aqueous pigment mixture.”

Support for the invention of claim 10 is also to be found on page 5, lines 3 to 9, under the Summary of the invention, and also on page 6, lines 9 to 18. There are no drawings in the application.

### **Grounds of Rejection to be Reviewed on Appeal**

The following issues are presented for review by the Board of Patent Appeals and Interferences:

1. Whether Claims 1, 3-7, and 9 fail to meet the written description requirement under 35 U.S.C. 112, first paragraph.
2. Whether Claims 1, 3-7, and 9 are indefinite under 35 U.S.C. 112, second paragraph
3. Whether claims 10 and 12 are anticipated by Lin under 35 U.S.C. 102(b).

## **Arguments**

### **Rejection of Claims 1, 3-7, and 9 under 35 U.S.C. 112, first paragraph.**

The Examiner contends that Claims 1, 3-7, and 9 fail to comply with the written description requirement. The Examiner contends that the phrase “wherein essentially no monomer is present in the aqueous mixture” is a negative limitation that violates the description requirement, since there is no support in the present specification for such exclusion. The claims in question are believed to meet the requirements of the rules. The addition of the term “essentially” does not change the meaning of the originally claimed invention, since (by analogy) the term “consisting essentially of” is well known not to be new matter, even though in haec verba support may not be found in the specification.

Clearly the original specification disclosed that there is no monomer present in the aqueous mixture. This is to be found on page 6, lines 9-18, where the present specification states:

The present invention uses a special sequence of adding the initiator – that is, a portion is added to the colorant mixture prior to adding the monomer mixture. This sequence allows the radicals formed from the initiator during heating to be absorbed to the colorant surface; hence, when the monomer mixture is added later, the monomers will polymerize on the colorant surface rather than form separated polymer particles. [page 6, lines 9-14]

The Examiner is apparently opposed merely to the word “essentially.” Accordingly, the Examiner’s position is that absolutely no monomer must be present in the aqueous pigment mixture according to the present invention. The phrase in question would not be entitled to the doctrine of equivalents under Festo Corp. v. Shoketsu Kinzoku Kogyokabushiki Co., 535 U.S. 722 (2002, 234 F.3d 558. Hence, according to the Examiner’s reading of the claimed invention, a potential infringer could design around the invention merely by throwing a single monomer into the mixture. Thus, the Examiner is only willing to allow the claim if it is essentially worthless. It is respectfully submitted that this approach does not promote innovation, contrary to the Constitutional purpose of the patent

system. If the Board believes that the purpose of the patent system is to discourage R&D in the United States, then this rejection should be sustained.

Rejection of claims 1, 3-7, and 9 under 35 U.S.C. 112, second paragraph.

Claims 1, 3-7, and 9 are also found indefinite for the reason that “essentially” in claim 1 is indefinite. Applicants submit that there are thousands of patents that employ the term “consisting essentially.” In fact, the MPEP 2111.03 states that the transitional term “consisting essentially of” limits the scope of the claim to the specified materials or steps “and those that do not materially effect the basic and novel characteristics “ of the claimed invention. Hence, the Examiner is incorrect is stated that such words have no meaning.

In fact, the basic and novel characteristics of the present invention relate to the increased stability of the claimed composite pigment particles that are obtained by having essentially no monomer present in the aqueous pigment mixture, so that the polymer is essentially formed when adding a monomer mixture. If a single monomer were added to the aqueous pigment mixture, for example, which monomer did not partake in the formation of a polymer, then that monomer would not materially effect the basic and novel characteristics of the invention.

As a practical matter, the Examiner has presented no coherent or reasoned explanation as to why the Applicants cannot exclude the prior art by use of the phrase “consisting essentially.” In fact, the cited prior art does add monomer with the initiator and this phrase excludes that prior art without unduly limiting the scope of the invention. The Examiner’s refusal to give meaningful weight to the claimed invention is unsupported by the patent laws. It is well known that a new claim limitation does not require verbatim support, but assumes a reasonable, skilled artisan is reading the specification. The phrase “consisting essentially” is used to prevent a potential infringer from avoiding the claimed invention by superficially equivalent means, in order to provide reasonably effective claim coverage.

*Rejection of claim 10 under 35 U.S.C. 102(b) as anticipated by Lin.*

Applicants respectfully submit that a rejection for lack of novelty under Section 102(b) requires that the invention must be identically disclosed or described in the reference. Applicants respectfully submit that important and material limitations of their invention as claimed are not disclosed in the cited reference. Applicants respectfully submit that Lin does not disclose, teach, or suggest excluding monomer from the pigment mixture prior to addition of the initiation. The Examiner contends that the language “consisting essentially of” is construed as equivalent to “comprising” absent a clear indication of what the basic and novel characteristics are. Applicants contend, however, that the basic and novel characteristics clearly relate to the absence of monomer from the pigment mixture prior to addition of initiator, resulting in the basic and novel characteristic of stability. See summary of the invention: “The composite colorant particles of the invention have better stability than those prepared by the prior art and an ink formulated with such particles has good resistance to abrasion.” See also field of invention: The composite colorant particles are very stable and are useful for forming ink jet inks for ink jet printing.” See results on page 22-23 of the present specification.

Thus, the Applicants’ position is that the basic and novel characteristics of the invention is adversely and significantly affected and would be material changed by monomer being essentially present in the pigment mixture prior to addition of initiator. As stated in the application, the specified sequential addition of initiator to the pigment mixture essentially prior to adding monomer mixture to the pigment mixture allows radicals formed from the initiator to be absorbed to pigment surface and, when monomer mixture is added later, provides polymerization on the pigment surface rather than the formation of separated polymer particles, thereby resulting in a dispersion of the composite pigment polymer particles being stable as defined by said particles not flocculating for up to 20 minutes when a dispersion containing said particles is added to acetone at a 1% by weight concentration. The process of Lin and would not accomplish this,



for the reasons clearly stated by the Applicants and as reasonably supported by the experimental evidence provided by the Applicants.

The present issue relates only to anticipation and not obviousness. However, the present claims are also unobvious for the reasons stated during prosecution. The Applicants have, for example, submitted a declaration from Dr. Reczek describing an example that is similar to Examples VIB and IX wherein Lin discloses adding a (i) mixture of water, pigment, monomer, and initiator to (ii) mixture of monomer. The results clearly showed that the resulting particles are not stable and do not meet the requirements of amended claim 1. This example also shows that “the additional ingredients in the prior art, i.e. monomer, would in fact be excluded from the claims and that such ingredients would materially change the characteristics of the Applicant's invention.” This evidence, not only is relevant to the unobviousness of the present invention over what the Examiner explicitly considers the closest prior art, but supports Applicants’ interpretation that the phrase “consisting essentially of” with respect to the first portion of initiator cannot include monomer such as disclosed by Lin.

The Examiner stated that the declaration is not commensurate in scope with the prior art (Lin). Specifically, the Examiner states that declaration does not prepare composite colorant particles comprising monomer in the aqueous pigment mixture (as does Lin), but rather adds monomer (and initiator) to an already prepared pigment dispersion. The Examiner, therefore, alleges that contrary to the “closest” prior art (Lin), the monomer is not in the aqueous pigment mixture. The Examiner states that it is not clear what, if any, difference this would have on the stability results.

Applicants note, however, that Lin uses a monomer that forms a polymerized vinyl aromatic salt. These vinyl aromatic salts contain a hydrophilic moiety which can ionize in an aqueous liquid vehicle to form ionic charges on the pigment particles and thus result in a stable pigment dispersion. Since Applicants are using monomers that are mostly hydrophobic, which will not help in forming a stable pigment dispersion, it



is unnecessary to use the monomer in the preparation of a stable pigment dispersion.

Furthermore, Lin states, in column 9, lines 15-29, as follows:

The monomeric salt can be polymerized alone to form a homopolymer or together with another monomer...to form a copolymer containing the aromatic salt.... The resulting copolymer should be soluble or capable of forming a stable dispersion in the liquid vehicle selected for the ink composition. [col. 9, lines 26-29]

In point of fact, the polymers formed in the Examples of Lin are 100 percent formed from sodium para-styrene sulfonate salt. In contrast, the polymers formed in the present invention are mostly hydrophobic monomers such as methylmethacrylate. See, for example, the polymer compositions in Table 1 on page 17, of the present application. Clearly, it would not matter whether the monomers used in the present examples were added during or after preparation of the pigment dispersion, in contrast to the monomer used by Lin. (Furthermore, the initiator used by Lin is water soluble, potassium persulfate, in contrast to the initiator used in the present examples, AIBN.) Because the polymers used in Lin are primarily hydrophilic, they would not pass the Dry Rub and the Wet Rub Tests used for Table 3, on page 20, of the present invention. Further, the polymers based on ionic salt monomers used in Lin would not pass the stability test recited in claim 1, in which the a dispersion containing the composite pigment particles are added to acetone.

Thus, it may be mentioned in passing that the composite pigment particles of the present invention are fundamentally different than those in the prior art to Lin. In Applicants' invention, the initiator can go to the surface of the pigment first and the polymer formed from the monomer mixture, mostly hydrophobic, grows attached to the pigment via the initiator. In contrast, in Lin, the ionic salt monomer, via a hydrophobic aromatic group, goes to the surface of the pigment and the initiator is later dissolved in the aqueous carrier.

A significant advantage of the present invention is that polymers are not formed unattached in the aqueous carrier as compared to Lin in which any monomer not attached to the pigment might form an unattached polymer. The prevention of unattached polymer is one reason Applicants' dispersions are more stable and that unattached polymer does not precipitate out. Since Lin's polymer is hydrophilic, it is less likely to precipitate out, but on the other hand, the use of the highly ionic polymer would result in the use of the corresponding ink not passing the wet and dry rub test. Hence, Applicants invention is unexpectedly advantageous in providing both stability and resistance to wet and dry rub.

Furthermore, the present examples in the specification show that, with respect to the composite colorant particles having a colorant phase and a polymer phase, when the polymer phase of the particles is formed in situ, in the presence of the colorant using an emulsion polymerization process (wherein a portion of an addition polymerization initiator is added to an aqueous colorant mixture before adding a monomer mixture to the colorant mixture in a continuous process), then the resultant composite colorant particles are very stable and are useful for forming ink jet inks for ink jet printing. See Dispersion 1 on page 15 and Comparative Dispersions C-1 and C-2 on pages 17-18, which use other preparation techniques. The results on page 20 show that Applicants' ink formulated from particles of the invention have good stability and good or excellent resistance to abrasion as compared to inks using particles prepared by the prior art.

### **Summary**

In view of the above, it is respectfully submitted that the present claims are believed to be in conformance with the requirements of the rules. Furthermore, the subject matter of the claim 10 is not anticipated by Lin under 35 U.S.C. 102(b).

## **Conclusion**

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims .

Respectfully submitted,



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Enclosures

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

## **Appendix I - Claims on Appeal**

1. (Previously presented) Composite pigment polymer particles having a pigment phase and a polymer phase, said polymer phase of said particles being formed in the presence of said pigment in situ using an emulsion polymerization process wherein a first portion of an addition polymerization initiator consisting essentially of an initiator dissolved in a solvent is added to an aqueous pigment mixture before then adding a monomer mixture for forming the polymer phase to the pigment mixture to form a pigment/monomer mixture in a continuous process, the dispersion of composite pigment polymer particles being stable as defined by said particles not flocculating for up to 20 minutes when a dispersion containing said particles is added to acetone at a 1% by weight concentration; wherein the pigment mixture consists essentially of a pigment, a dispersant or surfactant and water, and wherein essentially no monomer is present in the aqueous pigment mixture.

2. (cancelled).

3. (Previously presented) The composite pigment polymer particles of Claim 1 wherein said polymer phase comprises a polymer formed from methyl methacrylate, ethyl methacrylate, butyl methacrylate, ethyl acrylate, butyl acrylate, hexyl acrylate, n-octyl acrylate, lauryl methacrylate, 2-ethylhexyl methacrylate, nonyl acrylate, benzyl methacrylate, 2-hydroxypropyl methacrylate, acrylonitrile, methacrylonitrile, vinyl acetate, vinyl propionate, vinylidene

chloride, vinyl chloride, styrene, t-butyl styrene, vinyl toluene, butadiene, isoprene, N,N-dimethyl acrylamide, acrylic acid, methacrylic acid, chloromethacrylic acid, maleic acid, allylamine, N,N-diethylallylamine, vinyl sulfonamide, sodium acrylate, sodium methacrylate, ammonium acrylate, ammonium methacrylate, acrylamidopropane-triethylammonium chloride, methacrylamidopropane-triethylammonium chloride, vinyl-pyridine hydrochloride, sodium vinyl phosphonate and sodium 1-methylvinylphosphonate, sodium vinyl sulfonate, sodium 1-methylvinyl-sulfonate or sodium styrenesulfonate.

4. (Previously presented) The composite pigment polymer particles of Claim 1 having a mean particle size of less than about 200 nm.

5. (Previously presented) The composite pigment polymer particles of Claim 1 having a mean particle size of less than about 80 nm.

6. (Previously presented) The composite pigment polymer particles of Claim 1 wherein said polymer phase is cross-linked.

7. (Previously presented) The composite pigment polymer particles of Claim 1 wherein said pigment phase of said composite pigment particles has a mean size of less than about 80 nm.

8. (cancelled)

9. (Previously presented) The composite pigment polymer particles of Claim 1 wherein the ratio of said pigment phase to said polymer phase is from about 30:70 to about 70:30.

10. (Previously presented) Composite pigment polymer particles having a pigment phase and a polymer phase, said polymer phase of said particles being formed in the presence of said pigment in situ using an emulsion polymerization process wherein a first portion of an addition polymerization initiator consisting essentially of an initiator dissolved in a solvent is added to an aqueous pigment mixture before then adding a monomer mixture for forming the polymer phase to the pigment mixture to form a pigment/monomer mixture in a continuous process, wherein the pigment mixture consists essentially of a pigment, a dispersant or surfactant and water, and wherein sequential addition of initiator to the pigment mixture essentially prior to adding monomer mixture to the pigment mixture allows radicals formed from the initiator to be absorbed to pigment surface and, when monomer mixture is added later, provides polymerization on the pigment surface rather than the formation of separated polymer particles, thereby resulting in a dispersion of the composite pigment polymer particles being stable as defined by said particles not flocculating for up to 20 minutes when a dispersion containing said particles is added to acetone at a 1% by weight concentration.

11. (new) The composite pigment polymer particles of claim 1 wherein no monomer is present in the aqueous pigment mixture.

12. (new) The composition of claim 10 wherein the first portion of an addition polymerization initiator consists of an initiator dissolved in a solvent, wherein the pigment mixture consists of a pigment, a dispersant or surfactant and water, and wherein sequential addition of initiator to the pigment mixture prior to adding monomer mixture to the pigment mixture allows radicals formed from the initiator to be absorbed to pigment surface and, when monomer mixture is added later, provides polymerization on the pigment surface rather than the formation of separated polymer particles.



## **Appendix II - Evidence**

Declaration under 37 C.F.R. §1.132 by Dr. James A. Reczak, dated January 24, 2006.

### **Appendix III – Related Proceedings**

None.

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In re Application of:

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COMPOSITE COLORANT  
PARTICLES

Serial No. 10/665,960

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Commissioner for Patents  
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Sir:

Group Art Unit: 1714

Examiner: Callie E. Shosho

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*Frieda Grinnell*

Frieda Grinnell

*January 24, 2006*

Date

**DECLARATION UNDER 37 C.F.R. § 1.132**

I, James A. Reczek, declare that:

1. I received a BS degree in chemistry from Merrimack College, and a Ph.D. in Chemistry from MIT in 1977. I joined Eastman Kodak Company in 1977 as a synthetic chemist responsible for new colorant technology. I became manager of a research group in 1984 responsible for special research projects, and had subsequent management assignments in the areas of pharmaceutical research, modeling, and dye research. I became responsible for the Inkjet Materials Lab in 1999, coordinating ink technology for a variety of ink jet printing projects, both within Kodak and in collaboration with subsidiaries and other partners. I have obtained 23 patents during my 28 years with Kodak, including several involving inkjet inks.

2. That research personnel under my direction performed the following experiment from 11/2/2000 to 11/7/2000.

3. Comparative Colorant Particle Dispersion C-3 was prepared as follows. 60 g of the Magenta Pigment Dispersion, 0.9 g of methyl methacrylate, 0.24

g of methacrylic acid, 0.06 g of divinyl benzene, 0.1 g of sodium dodecyl sulfonate and 0.012 g of potassium persulfate were added into a stirred reactor all together while keeping the reactor at 80° C in a nitrogen atmosphere for 1 hour; then 30 g of water, 3.6 g of methyl methacrylate, 0.96 g of methacrylic acid, 0.24 g of divinyl benzene, 0.4 g of sodium dodecyl sulfonate and 0.048 g of potassium persulfate were mixed well and added into the reactor continuously. The reactor was kept at 80° C for more than 4 hours and then cooled down. The final product was filtered to remove any coagulum.

4. This preparation is different from the one used to prepare the inventive composite particle composition in that part of the monomer was contained in the colorant mixture along with the initiator prior to adding a second monomer mixture. The stability of the particles was tested as described on page 22 of the above referenced patent application. The pigment dispersion prepared above, C-3, was stable for only 6 minutes.

5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1/24/06

Date

James A. Reczek  
James A. Reczek